CLAIMS

What is claimed is:

1. A method for wireless communication initiation for a wireless transmit/receive unit configured to communicate with base stations of a wireless system where each base station transmits an identifying synchronization channel (SCH) signal at a predetermined chip rate in a selected portion of a system time frame, the method comprising the steps of:

receiving a wireless signal including at least one SCH signal;

identifying received SCH signals using a power threshold based on a plurality of chip samples sampled at twice the chip rate;

selecting an identified SCH signal for decoding; and

decoding the selected SCH signal to determine system time frame timing and base station identity by determining a beginning of the SCH signal by identifying a chip location having a highest signal to noise ratio wherein the noise is computed using a predetermined number of chips that is less than the total number of chips in a frame.

2. The method of claim 1 wherein the SCH signal is transmitted in a predetermined timeslot of a system time frame and includes a primary synchronization code (PSC) transmitted in the timeslot at a predetermined chip offset wherein the decoding includes determining a t_{offset} at which the selected SCH is transmitted.

3. The method of claim 2 wherein the PSC having the highest power is detected by summing the peak PSC over four frames and dividing the summed power by an estimated noise value to obtain an signal to noise ratio for each chip in a frame.

4. The method of claim 2 wherein the chip with the highest signal to noise ratio is selected to obtain the location of the PSC sequence.

5. The method of claim 4 wherein the location of the PSC sequence is adjusted to identify the chip location at which the PSC sequence begins.

6. The method of claim 3 wherein the step of dividing is not implemented where the signal value is less than the threshold value.

7. The method of claim 1 further including the step of identifying whether the chip location of the PSC sequence was derived from an even sample or an odd sample where the PSC sequence is identified by processing a wireless communication signal at twice the chip rate.

8. A method for detecting a synchronization channel signal transmitted in a select timeslot of a system at a predetermined chip rate with a received communication signal that is sampled at twice the chip rate, the method comprising the steps of:

identifying a chip offset within a time frame having a maximum power value;

determining whether the chip offset was derived from an even sample or an odd sample where the chip location is identified by processing the wireless communication signal at twice the chip rate;

determining if the maximum power value is above a predetermined threshold value; and

outputting the chip offset such that the chip offset corresponds to the beginning of the synchronization channel where the maximum power value is above the predetermined threshold value.

9. A method for identifying a code group representative of a predetermined number of base stations which may include a base station with which a wireless transmit/receive unit may synchronize to communicate, the method comprising the steps of:

inputting a chip offset within a frame into a first correlator;

inputting a plurality of samples of chips at which a primary synchronization code (PSC) has been detected into the first correlator;

inputting a peak PSC into a second correlator and taking the complex conjugate of the PSC;

multiplying the output of the first correlator by the complex conjugate of the PSC to obtain a magnitude for the signals being transmitted at the chips inputted into the first correlator;

summing the magnitude over four frames;

evaluating the summed signals view of a predetermined set of decision variables; and

determining a case number, a code group, a timeslot location, and system frame number based on said evaluation and a noise estimation.

10. The method of claim 9 wherein the output of the first correlator is multiplied by the complex conjugate of an estimate of the phase of a previously detected primary synchronization code.

11. The method of claim 9 wherein 256 samples are input into the first correlator.

12. The method of claim 9 wherein 512 samples are input into the first correlator.

13. A method for identifying a base station with which a wireless transmit/receive unit may synchronize based on a previously determined primary synchronization code and code group, the method comprising the steps of:

identifying two midambles associated with basic midambles belonging to a previously identified code group, wherein the identified code group includes a plurality of midambles;

inputting each set of midambles into a number of correlators wherein the number of correlators corresponds to the number of midambles in the identified code group;

accumulating signal values of each midamble over a predetermined number of frames; and

selecting the midamble having the highest accumulated signal.

14. The method of claim 13 wherein a 57 chip delay is imparted on one of the two midambles that are associated with a basic midamble prior to accumulation of the signal values.

15. The method of claim 14 wherein the two midambles are accumulated in an alternating manner to avoid accumulation of midambles from a single correlator.

16. A wireless transmit/receive unit (WTRU) configured to communicate with base stations of a wireless system where each base station transmits an identifying synchronization channel (SCH) in a selected portion of a system time frame, the WTRU comprising:

a receiver configured to receive a wireless signal including at least one SCH signal;

at least one correlator configured to identify received SCH signals using a power threshold based on a plurality of chip samples sampled at twice the chip rate;

a processor for selecting an identified SCH signal for decoding;

a processor for decoding the selected SCH signal to determine system time frame timing and base station identity by determining a beginning of the SCH signal by identifying a chip location having a highest signal to noise ratio wherein the noise is

computed using a predetermined number of chips that is less than the total number of chips in a frame.